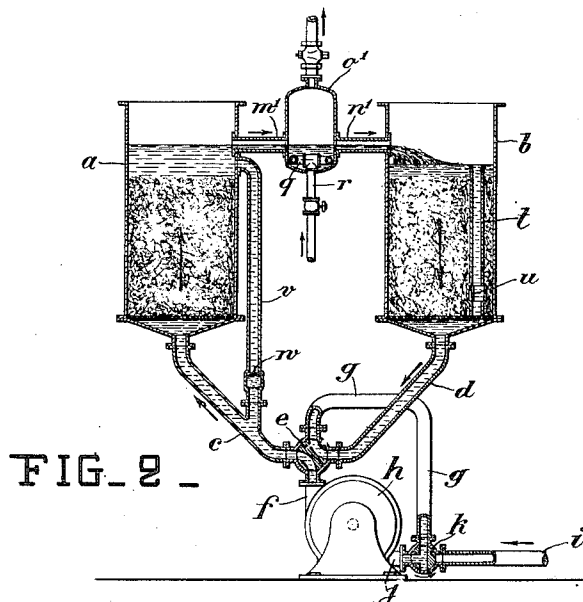
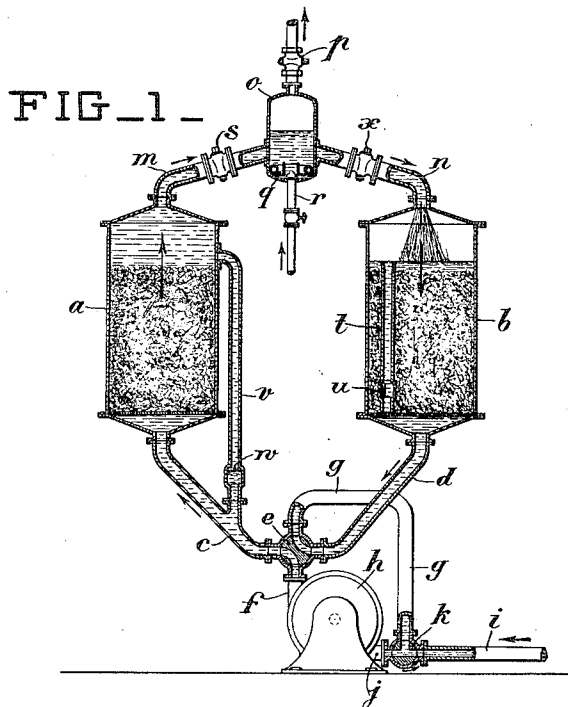


R. WEISS.
 PROCESS OF TREATING TEXTILE MATERIALS.
 APPLICATION FILED JULY 17, 1908.

986,332.

Patented Mar. 7, 1911.



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ROBERT WEISS, OF KINGSHEIM, GERMANY.

PROCESS OF TREATING TEXTILE MATERIALS.

986,332.

Specification of Letters Patent.

Patented Mar. 7, 1911.

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To all whom it may concern:

Be it known that I, ROBERT WEISS, chemist, a citizen of the Swiss Republic, and resident of Kingersheim, Alsatia, Germany, have invented new and useful Improvements in Processes of Treating Textile Materials, of which the following is a full, clear, and exact specification.

My invention relates to a process for treating, especially for boiling, washing and bleaching textile materials with a bath flowing in a reversible circuit and has for its object to accelerate, simplify and cheapen the said treatment as compared with similar processes at present in use, particularly as regards the completeness, the duration of the process and the expenditure upon chemicals and fuel.

According to my invention, the process consists of subjecting by periodical successions the textile material to three different successive operations with one and the same liquid in such a way that the material is first impregnated in full bath by forcing the liquid through it preferably in a direction from below to above, then after reversing the direction of circulation, drained almost completely by aspiration from below and further moistened from above so as to be traversed from above to below only by a kind of percolating or filtering action, in order to be more capable of absorbing liquid on the next reversion of circulation in view of a repeated pull impregnation of the material. In this way, I obtain by periodical successions first a thorough impregnation of the material in full bath, then a draining of the material with subsequent percolation of liquid through the latter so as to render the material more able of absorbing liquid on the next reversion of the circulation, afterward a new thorough impregnation of the material in full bath, when the circulation is reversed, and so on. The fact that the material is drained almost completely and then reimpregnated thoroughly insures a thorough, rapid and economical treatment of the material.

The new process is preferably carried out alternately in two closed or open treating vessels, by using a quantity of liquid only slightly greater than that corresponding to the treatment of the material in one single vessel, in such a manner that, while in one of the vessels the thorough impregnation of

the material is effected in full bath, simultaneously the draining of the material in the other vessel takes place by aspiration of the liquid from the lower part of this vessel.

To illustrate the new process I have annexed to this specification a diagrammatic drawing showing two forms of apparatus, for carrying out the process, of which the apparatus shown by Figure 1 is supposed to be employed with a treating liquid heated above 100° C., both the vessels being closed, while Fig. 2 shows an apparatus wherein both the vessels are open.

The apparatus represented in Fig. 1 consists of two closed treating vessels *a*, *b* placed on the same level, which may suitably be provided with strainers on their floors, and are connected by the pipes *c*, *d* with two of the nozzles of a four-way cock *e*, for reversing the direction of circulation of the treating liquid, the two other nozzles of this cock being connected by the pipes *f*, *g* with a rotary pump *h*. The pipe *g* is connected with the feed pipe *i* for liquid and the suction nozzle *j* of the pump *h* by a three-way cock *k*. At their upper part the vessels *a*, *b* are connected by two pipes *m*, *n* with an intermediate vessel *o*, which is provided with a cock *p* for the exit of air and a steam heating coil *q* with a feed cock *r*. The pipes *m*, *n* are provided with cut-off cocks *s*, *x* respectively.

In the treating vessel *b* there is arranged an overflow pipe *t* which is provided with a valve *u* opening downward. For the vessel *a*, this arrangement is, for the sake of example, somewhat modified. In this case the overflow pipe *v* is connected to the vessel *a* on the exterior, and it is also connected with the pipe *c* and similarly contains a retaining valve *w*. The object of this arrangement will be seen from the following description.

With this apparatus the process carried out in the following manner: After the vessels *a*, *b* have been charged with the material to be treated the first thing is to expel the air from the apparatus. The pump is fed through the pipe *i* with the liquid to be used, which in the position of the four-way cock *e*, shown in the drawing is forced into the vessel *a* by the pump through the pipes *f*, *c*, flows through the material contained in the vessel *a* and fills the latter, at the same time driving out the air, which escapes through the opened air-exit cock *p*. Finally the

liquid passes over into the vessel *b*. At this moment the admission of liquid through the pipe *i* is interrupted by turning the three-way cock *k* in the direction of the arrow.

5 By this means there has been admitted into the apparatus, in spite of the presence of two treating vessels scarcely more liquid than corresponds to the amount of material to be treated in a single vessel. By turning

10 the cock *k*, the pipes *g*, *d* are brought into connection with the suction nozzle *j* of the pump, and a movement of circulation of the liquid takes place in such a way that the liquid, if the material in the vessel *b* is sufficiently

15 penetrable, is drawn through this latter. If, on the contrary, the material offers a certain resistance to the percolation of the liquid, the liquid which passes through the pipe *n* into the vessel *b* accumulates

20 above the material and finally flows through the overflow pipe *t*, the valve *u* of which is open, directly toward the pipe *d* and to the pump, so that the feeding of the latter is not affected by the impenetrability

25 of the material in the vessel *b*. After the movement of circulation of the liquid has been thus brought about the latter is heated by means of the steam heating coil *q*.

As the liquid begins to boil the cock *s*

30 in the pipe *m* is closed, and the four-way cock *e* is turned through 90° in order to reverse the course of the liquid. The vessel *a* empties itself of liquid while the liquid in the vessel *b* rises, penetrates the material in the latter, the valve *u* being closed auto-

35 matically, and at the same time the liquid forces any air which may still remain in the vessel through the cock *p*. The liquid finally reaches the pipes *n*, *m*, when the

40 cock *s* is again opened and a similar movement of circulation of the liquid set up as before, but with the difference that it now takes place in the contrary direction. The parts of the apparatus are now empty of

45 air. The heating of the liquid is continued, and it is then only necessary to reverse from time to time the four-way cock *e*, first in one direction and then in the other, in order to carry out the proper treating process.

50 As a matter of fact in one working position of the four-way cock *e*, for example that shown in the drawing, the material in the vessel *a* is steeped or impregnated in full bath under pressure by the liquid

55 supplied by the pump, while at the same time the liquid from the lower part of the vessel *b* is sucked away to drain the material therein and the amount of liquid which passes over into the vessel *b* percolates by a kind of dripping or filtering action through the material in this vessel, if it be sufficiently penetrable; but if the charge be insufficiently penetrable the liquid is able to run off immediately through the overflow pipe *t*

60 whence it collects in the lower part of the

vessel *b* and serves for feeding the pump. If the four-way cock *e* be turned through 90° the vessels *a* and *b* exchange their functions, in so far as that the vessel *b* serves for the treatment in full bath, of its contents drained during the preceding phase and the vessel *a* for the treatment of its contents in the percolating or filtering process. From what has been said it follows in the first place that here, by working with

70 two vessels for the material at the same time, the process can be carried out with much less liquid than was formerly required, that is to say, that scarcely more liquid is required than would be necessary for treating the material in one of the vessels. From

75 this there results considerable economy in liquid, and, in correspondence therewith, in fuel also in order to bring the former to the temperature desired. It is also to be

80 remarked, however, with reference to the chemicals, that since, as the result of the presence of a smaller quantity of liquid they are less diluted, and can be more completely

85 used up, while a more rapid action is obtained as the result of greater concentration, there naturally results economy in chemicals and time.

The apparatus shown in Fig. 2 differs from that above described in so far as the

90 two treating vessels *a*, *b* are open above and are directly connected below their upper edge to one another by the pipes *m*¹, *n*¹ and the intermediate vessel *o*¹, which obviously may also be omitted.

100

The apparatus illustrated and described in the present application is claimed in my divisional application, Serial No. 520,116, filed September 29, 1909.

What I claim is:

105

1. A process for treating, especially for boiling, washing and bleaching textile materials with a bath flowing in a reversible circuit, which process consists of subjecting by periodical successions the textile material

110 to three different successive operations with one and the same treating liquid namely, by first impregnating the material in full bath by forcing the liquid through it, then reversing the direction of circulation and

115 draining off the liquid almost completely by aspiration from below and then moistening from above so as to traverse the material from above to below only by a kind of percolating or filtering action, substantially as

120 and for the purpose described.

2. A process for treating, especially for boiling, washing and bleaching textile materials with a bath flowing in a reversible circuit, which process consists of subjecting by

125 periodical successions a plurality of batches of textile material to three different successive operations in one and the same treating liquid, namely by first impregnating the material in full bath by forcing the

130

liquid through it in a flow from below to
above, then reversing the direction of cir-
culation and draining off the liquid almost
completely by aspiration from below and
5 then moistening from above so as to be
traversed from above to below only by a
kind of percolating or filtering action, the
immersion of one batch occurring while
draining and moistening occurs in another

batch, substantially as and for the purpose 10
described.

In witness whereof I have hereunto
signed my name this sixth day of July 1908,
in the presence of two subscribing witnesses.

ROBERT WEISS.

Witnesses:

AMAND RITTER,

ERNST WAGNER.